Stormwater Management and Other Neighborhood Improvements

PROGRAM DESCRIPTION

The Stormwater Management and Other Neighborhood Improvements section consists of: Stormwater Control, Streetlights, and the County Neighborhood Improvement Program.

LINK TO THE COMPREHENSIVE PLAN

Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Provide a system of drainage facilities that prevents or minimizes property damage, traffic disruption and stream degradation in an efficient, cost-effective and environmentally sound manner.
- ✓ Strengthen programs to improve older residential areas of the County to enhance the quality of life in these areas.

Source: 2003 Edition of the Comprehensive Plan, as amended

CURRENT PROGRAM INITIATIVES

Storm Water Control

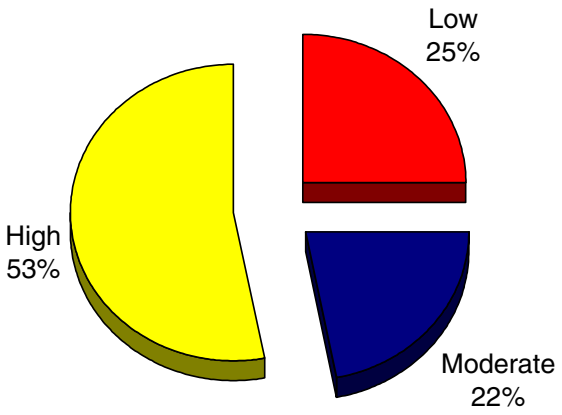
The Storm Water Control program has evolved into a watershed-based approach to address stormwater management in a more comprehensive manner. The county's comprehensive stormwater management program involves several components which range from providing facilities (structural) to alleviate storm water control deficiencies to conducting pollution prevention through public outreach and education (non-structural). The long ranged goal or mission for this program is dictated by the county's need to preserve and restore the natural environment and water resources while being in full compliance with all applicable federal and state laws and mandates. Some of these mandates are derived from the State's Chesapeake Bay Initiatives, Clean Water Act's National Pollutant Discharge Elimination System's Municipal Storm Sewer System (MS4) Stormwater Discharge Permit regulations, and other County policies such as the Water Supply Protection Overlay District. An effective tool to implement the Storm Water Control program on a comprehensive holistic basis is to develop and implement watershed management plans. The county's current watershed or master plans are outdated (developed during 1970's) and do not reflect changes in technology, infrastructure, land-use and development, and stream conditions. As part of the overall comprehensive stormwater management program, the county has commenced an initiative to develop updated watershed management plans over a 5 to 7 year timeframe. This is necessary for the following key reasons:

1. 77 Percent of the County's streams are in fair to very poor condition

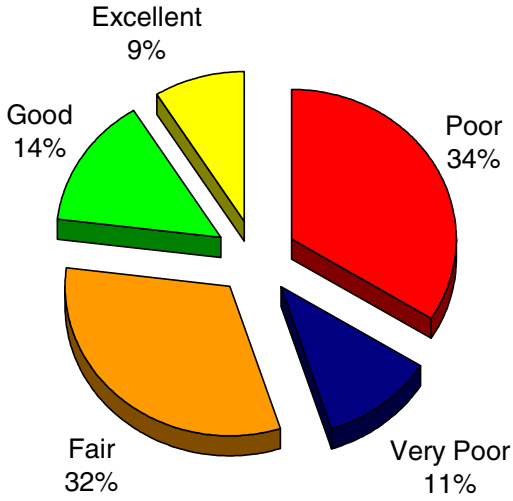
In 2001, a Stream Protection Strategy (SPS) study was conducted and a baseline evaluation indicated that 77 percent of the county's streams were in fair, poor or very poor condition. This measurement is determined by a measured Index of Biotic Integrity (IBI) which represents biological health within streams. The study also determined that stream quality and IBI are related to the percentage of impervious area (area that is impenetrable or unable to absorb water). IBI is measured on a scale of 0 to 100 (100 representing the best stream quality achievable). As imperviousness increases, IBI decreases along with the quality of streams. Over the last several decades, the county's percent of imperviousness has

increased drastically due to additional development, contributing to the current degradation in streams. It is believed that stream degradation begins to occur when imperviousness is between 10-20 percent and high levels of degradation will occur when imperviousness exceeds 20 percent. As depicted here, over 53 percent of the County land area has imperviousness above 20 percent (high). In addition, 22 percent of the County land area is between 10-20 percent imperviousness (moderate) and 25 percent is between 0 percent and 10 percent (low) imperviousness. Therefore, 75 percent of the County land area has imperviousness which is moderate to high.

Countywide Imperviousness Distribution

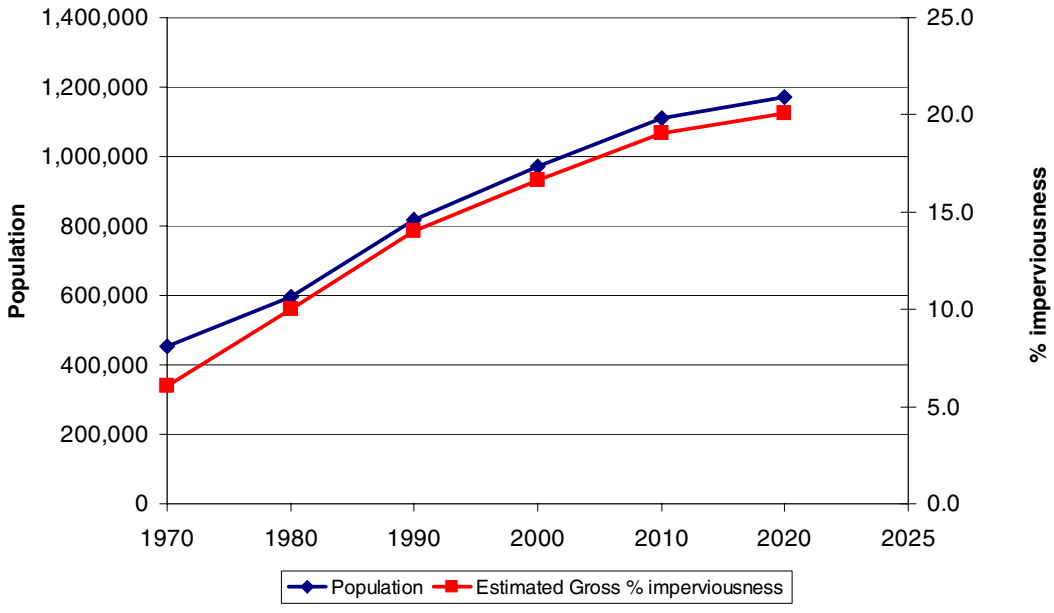


Countywide Stream Conditions Based on IBI



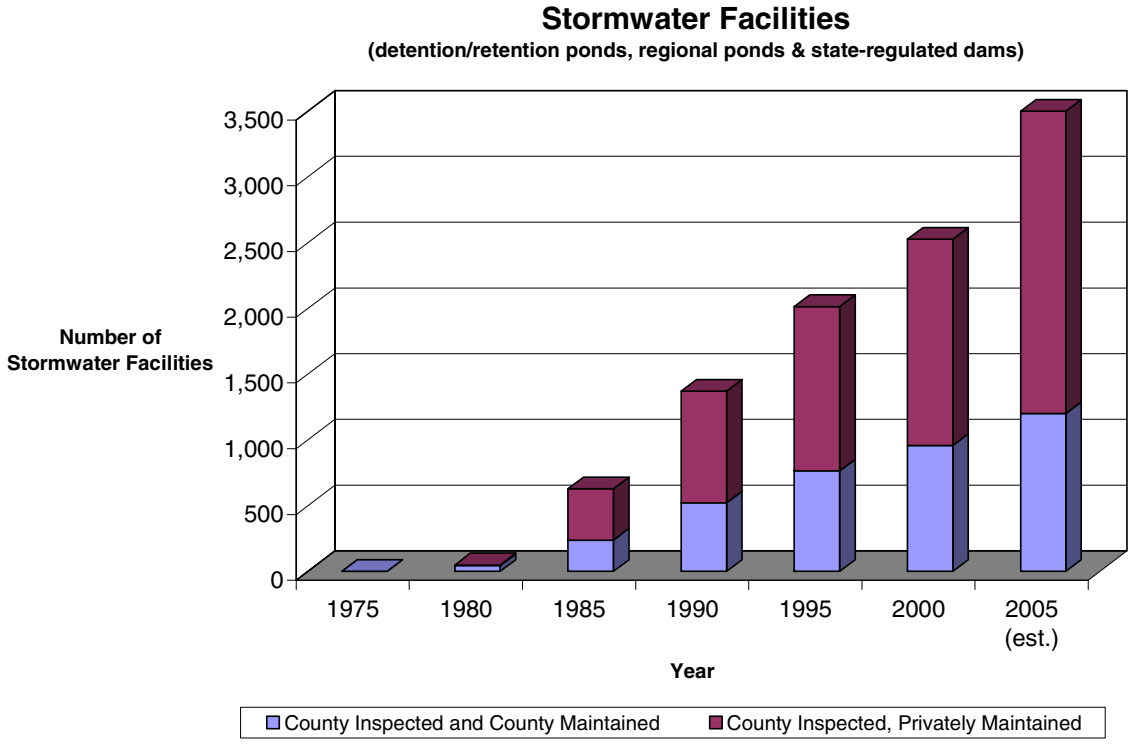
In addition, over the last several years, the Fairfax County Health Department's monitoring data has shown that over 85 percent of County streams have elevated levels of fecal coliform which can produce serious health risks to the public who come in contact with water in these streams. The imperviousness trend in the County is depicted below and was derived from GIS planimetric layers and population data. This data demonstrates that population and housing units also impact the imperviousness of the County. Imperviousness increased from 6.1 percent in 1970 to 17.4 percent today. The Fairfax County population in 1970 was 454,275 and the number of housing units was 130,800. This compares to a population of 1,019,000 and 375,000 housing units today. These factors all influence the overall IBI which indicates that most streams in the County are under stress and in some state of degradation. The County is using watershed planning as one tool to review the entire water and ecological system, in order to better manage these resources.

Population vs. Percentage of Imperviousness



2. *In order to meet state and federal water quality standards, the County's watershed plans have been designed to identify strategies to prevent and remove stream pollution*

The federal Clean Water Act and Virginia laws require Fairfax County to meet water quality standards for surface streams and groundwater. The County's stormwater permit, the Virginia Pollution Discharge Elimination System (VPDES) or Municipal Separate Storm Sewer System (MS4) permit, requires the County to develop watershed management plans to address water quality problems. Typically, nutrients such as phosphorus and nitrogen (lawn fertilizers) are the most damaging pollutants found in stormwater runoff. Other common pollutants include oil, dirt and trash. A watershed management plan serves as a tool to identify pollution sources and develop strategies to address them. In addition, the VPDES/MS4 permit provides the County the privilege to discharge stormwater from its storm sewer network into the waters of the commonwealth. If the county does not conform to state water quality standards, this permit can be revoked and the County would lose the privilege to discharge into the state waters. The County currently maintains 1,087 publicly owned stormwater detention facilities and 1,200 miles of piped storm sewer and improved channels which are constantly increasing with increased development. Approximately 20 percent of the privately owned stormwater management facilities are inspected annually as depicted by the chart below. Planned rehabilitation and replacement of aging infrastructure such as dams and storm drainage pipe systems are necessary to ensure proper functionality and minimize safety hazards to the public and violations of the VPDES/MS4 permit. Maintenance requirements increase proportionally as the infrastructure base grows over time.



3. *In order to support the Chesapeake 2000 Agreement, Fairfax County is committed to developing watershed management plans for all of its watersheds.*

Fairfax County's watersheds drain into the Potomac River and eventually into the Chesapeake Bay; however, the Bay does not currently meet federal water quality standards. Virginia has signed agreements with other states and federal agencies to work toward restoring the Chesapeake Bay. The latest agreement, *Chesapeake Bay 2000,* includes the goal of developing watershed plans for two thirds of the Bay's watersheds by 2010. In order to meet this goal, Virginia has encouraged Fairfax County and other jurisdictions to develop plans for cleaning up their watersheds. Virginia and other signature states to the Chesapeake Bay agreement are also preparing "Tributary Strategies" to set specific targets for reduction and capping of nutrients and sediment pollutants entering the Bay through its various tributaries, such as the Potomac River. The Potomac Tributary Strategy is expected to be completed by 2004 after which jurisdictions will be expected to cooperate with implementation of increased water

pollution control measures to effectively improve conditions and help remove the Bay from the federal impaired ("dirty") waters list by 2010.

4. *The County's 25-year old watershed plans are out-of-date and need to be replaced to meet new water quality standards using innovative technologies.*

Growth in the County over the last 50 years has resulted in eroded stream channels and, in some cases, impaired waters. As the 1970's era watershed plans have aged, many newer drainage problems have been addressed on a reactionary basis. Watershed planning is a way to identify the causes of these problems and then to address them in an integrated fashion. The watershed plans currently being developed will propose effective, state-of-the-art solutions for the next 25 years.

5. *There are multiple environmental regulations, commitments, and community needs that can be addressed comprehensively through the watershed planning process.*

A stream that is clean provides abundant and healthful habitat for fish, wildlife and people. Because all land surfaces and all land uses are in a watershed, the watershed planning process provides an opportunity to integrate planning, zoning, and other management strategies in a comprehensive approach to reducing and preventing pollution. Integrated solutions will achieve the broadest range of goals, with the greatest efficiency, and at the lowest cost. It is recognized that an effective implementation of a watershed management plan will require investment in capital improvements and maintenance above current levels.

As a means of implementing the County's storm water control plans, various funding mechanisms have been utilized including General Obligation Bond funding, General Funds and Pro Rata Share Deposits. Some General Obligation Bond funds remain from the 1988 Storm Drainage Bond Referendum. The Uniform Pro Rata Share Program was adopted in 1992 and requires one-time payments from developers of new developments to pay for a portion of the costs of off-site improvements. This system more evenly and equitably spreads the cost of storm water control capital improvements to the total area benefiting from the improvements. However, the funding provided through all of these funding sources only addresses a small portion of the County's storm water control needs. The current backlog of unfunded storm water control project stands at over $325 million, including approximately 660 identified unfunded storm water Control projects at this time. These projects are prioritized into the following categories:

Category 1: Projects that are legally mandated by state or federal regulations for immediate implementation, and projects that address critical/emergency dam safety issues. Many of these projects are in progress; however this category also includes house flooding projects which are implemented as funds become available.
Category 2: Projects that alleviate structures from damage associated with flood water or are being undermined by severe erosion.
Category 3: Projects that achieve storm water quality improvement in specific conformance with the County's obligation under the Chesapeake Bay initiatives and/or the County's requirements under the MS4 Permit for storm sewer system discharges.
Category 4: Projects that alleviate severe stream bank and channel erosion.
Category 5: Projects that alleviate moderate and minor stream bank and channel erosion.
Category 6: Projects that alleviate yard flooding.
Category 7: Projects that alleviate road flooding.

As the Watershed Management Plans are completed throughout the County, the Stormwater Control Projects in all seven categories will be updated. As that occurs, revised funding requirements for the entire program will be developed.

The storm water control policy contains a provision that allows flexibility to select projects for funding not based on priority order but based on opportunities for the County to save substantial funds during implementation. These situations arise when developers proffer to contribute to the storm water control program by providing funding, land rights, design, and/or construction for specific projects. In addition, the County participates in cost sharing with VDOT, developers, and other agencies for the joint implementation of storm water control projects. In limited situations, projects will be selected for partial County funding based on opportunities to participate with others who volunteer to contribute or participate by providing funding, land, design, or construction for a particular project.

Streetlights

The County Streetlight Program responds to the desires of citizens for additional community lighting in the interest of promoting the Crime Deterrence and Hazardous Intersection programs. New streetlights are installed at the County's expense based on citizens' requests and at the developer's expense in new developments. The costs of this program are primarily to fund the installation of streetlights and are supported by the General Fund.

Neighborhood Improvement Program

Many neighborhoods in Fairfax County which were built before subdivision control ordinances were enacted, lack such public facilities as sidewalks, curbs, gutters and storm sewers. As a result, some of these neighborhoods have roads that are too narrow to accommodate today's traffic. They lack sidewalks for safe access to schools and shopping, and they experience flooding in streets, yards and homes. These conditions contribute to the deterioration of neighborhoods and the decline of property values. In an effort to remedy this situation, the Board of Supervisors established the cooperative Neighborhood Improvement Program. This program is funded through General Obligation Bonds and homeowners' contributions. A minimal amount of bond funding still remain from the last bond referendum for neighborhood improvements in 1989. All of the final neighborhoods in the current program are complete or currently under construction. A Neighborhood Improvement/Commercial Revitalization Bond Referendum is proposed for fall 2006.

CURRENT PROJECT DESCRIPTIONS

1. **Dam Inspections, Improvement and Repairs.** This project is a continuing Countywide project to ensure ongoing integrity, stability and safety of the County owned and maintained dams. This project funds state mandated recertification inspections, improvements and necessary dam repairs. The six public law 83-566 dams are eligible for federal cost sharing funds at the rate of 65 percent. The local 35 percent can be in-kind costs for the value of the land rights, project administration and other planning and implementation costs associated with the project.

2. **Emergency Watershed Improvements.** This project is a continuing Countywide project to correct small scale emergency drainage and flooding problems that occur throughout the fiscal year. These projects often serve as an avoidance mechanism for costly legal action on the part of the flooded homeowner.

3. **Kingstowne Environmental Monitoring.** This project supports the Kingstowne Environmental Monitoring program, which was established by the Board of Supervisors in June 1985 and is intended to continue until completion of the Kingstowne Development. In FY 2002, the program was expanded to include the water quality monitoring requirements required by the U.S. Army Corps of Engineers for the development of the South Van Dorn Street extension. A new monitoring station has been installed on Dogue Creek as part of the monitoring and maintenance plan for the extension project. The station is located downstream of Telegraph Road and monitors the entire Silver Springs subwatershed of Dogue Creek. The purpose of the new monitoring program is to evaluate the effectiveness of stormwater management improvements made throughout the subwatershed to achieve a 50 percent removal rate of phosphorus. The original Kingstowne monitoring program continues to be used to evaluate sediment from the Kingstowne development.

4. **Virginia Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (MS-4)**. This is an on-going Countywide program to provide for the activities associated with the Virginia Pollutant Discharge Elimination System (VPDES) Municipal Separate Storm Sewer System (MS4) discharge permit, which is required as part of the Clean Water Act amendments of 1987, and mandates implementation of a water quality management program. The MS4 discharge permit is considered a renewal of the National Pollutant Discharge Elimination System (NPDES) permit, and is subject to renewal every five years. The MS4 Permit has required the County to develop a comprehensive stormwater management program which includes water quality testing, watershed master planning, improvement programs, retrofitting of existing facilities, industrial and high risk runoff elimination, infrastructure management, public education, monitoring programs, and development of a GIS-based storm sewer system inventory.

5. **Indian Springs II Storm Drainage.** $930,000 for the installation of approximately 2,800 linear feet of storm sewer structures to alleviate flooding and erosion problems in the Clearfield Subdivision. This project is supported by the 1988 Storm Drainage Bond Referendum.

6. **Long Branch Storm Drainage.** $920,000 for the installation of approximately 1,200 linear feet of streambank protection to resolve serious erosion along Long Branch at Four Mile Run. This project is supported by the 1988 Storm Drainage Bond Referendum.

7. **Hayfield Farms Storm Drainage.** $840,000 for the construction of flood proofing and storm drainage improvements to alleviate house flooding of several homes within Hayfields Subdivision. This project is supported by the 1988 Storm Drainage Bond Referendum.

8. **Structural Protection.** This project provides funding for storm drainage house flooding projects identified as of March 2002. As projects are scoped and their viability assessed, implementation begins. This project is supported by the 1988 Storm Drainage Bond Referendum.

9. **Developer Defaults.** The Developer Default project is a continuing program for the purpose of completing private development projects on which developers have defaulted. This program is supported by developer bonds and the General Fund.

10. **Payments of Interest on Conservation Bonds.** This project provides for payments to developers for interest earned on conservation bond deposits. The County requires developers to make deposits to ensure the conservation of existing natural resources. Upon satisfactory completion of the project, the developer is refunded the deposit with interest. Funding is based on prior year actual expenditures and current interest rates.

11. **Citizen's Petition Streetlights Program.** This is a program for the installation of streetlights in established neighborhoods via a citizen petition process. The County assumes the subsequent payments to the electric utility company for the operation and maintenance costs.

12. **Secondary Monumentation**. This is a continuing project to support the maintenance and establishment of control points for the GIS system. Monumentation is placed on the ground for the use of both the private and public sector for surveying and mapping control.

13. **Brookland Bush Hill II.** $2,200,000 for 6,130 linear feet of street improvements including curb and gutter and storm drainage appurtenances to Piedmont Drive, Pratt Street, Pratt Court, a portion of Ambler Street, and Saratoga Street. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

14. **Mount Vernon Manor.** $3,780,000 for approximately 5,100 linear feet of street improvements including curb and gutter, sidewalk, and storm drainage appurtenances to Lea Lane, Oak Leaf Drive, and McNair Drive. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

15. **Fairdale.** $1,890,000 for street and drainage improvements to Pine Drive and Sipes Lane. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

16. **Holmes Run Valley.** $50,000 for street and drainage improvements to the following streets: Rose Lane, Valley Brook Drive, Beechtree Lane, Slade Run Drive and Skyview Terrace. Only $50,000 for planning funds is authorized at this time. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

17. **Mount Vernon Hills.** $50,000 for street and drainage improvements to the following streets: Maryland Street, Vernon Avenue, Braddock Avenue, Sexton Street, Woodward Avenue and Curtis Avenue. Only $50,000 for planning funds is authorized at this time. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

PROJECT COST SUMMARIES
STORMWATER MANAGEMENT AND OTHER NEIGHBORHOOD IMPROVEMENTS
($000's)

Project Title/ Project Number	Source of Funds	Anticipated to be Expended Thru FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total FY2005-FY2009	Total FY2010-FY2014	Total Project Estimate
1. Dam Inspections, Improvement and Repairs / N00096	G	***C***	***100***	100	100	100	100	500	500	1,000
2. Emergency Watershed Improvements / A00002	G	***C***	***95***	95	95	95	95	475	475	950
3. Kingstowne Environmental Monitoring / L00034	G	***C***	***125***	125	125	125	125	625	625	1,250
4. Virginia Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (MS-4)/ Z00022	G	***C***	***2,420***					2,420		2,420
5. Indian Springs II / X00084	B	***920***	***10***					10		930
6. Long Branch/X00087	B	***920***						0		920
7. Hayfield Farms / X00093	B	***650***	***190***					190		840
8. Structural Protection / X00094	B	***1,490***	***450***	***280***	***180***			910		2,400
9 Developer Defaults / U00006	G, X	***C***	***100***	100	100	100	100	500	500	1,000
10 Payments of Interest on Conservation Bonds / 009998	G	***C***	***350***					350		350
11. Citizen's Petition Streetlights Program / Z00001	G	***C***		1,000	1,000	1,000	1,000	4,000		4,000
12. Secondary Monumentation / U00005	G	***C***	***75***	75	75	75	75	375		375
13. Brookland Bush Hill II / C00072	B	***2,180***	***10***	***10***				20		2,200
14. Mount Vernon Manor / C00091	B	***3,740***	***40***					40		3,780
15. Fairdale / C00093	B	***1,740***	***150***					150		1,890
16. Holmes Run Valley / C00097	B	***10***	***20***	***20***				40		50
17. Mount Vernon Hills / C00098	B	***10***	***20***	***20***				40		50
TOTAL		$11,660	$4,155	$1,825	$1,675	$1,495	$1,495	$10,645	$2,100	$24,405

Key: Stage of Development
- Feasibility Study or Design
- Land Acquisition
- Construction

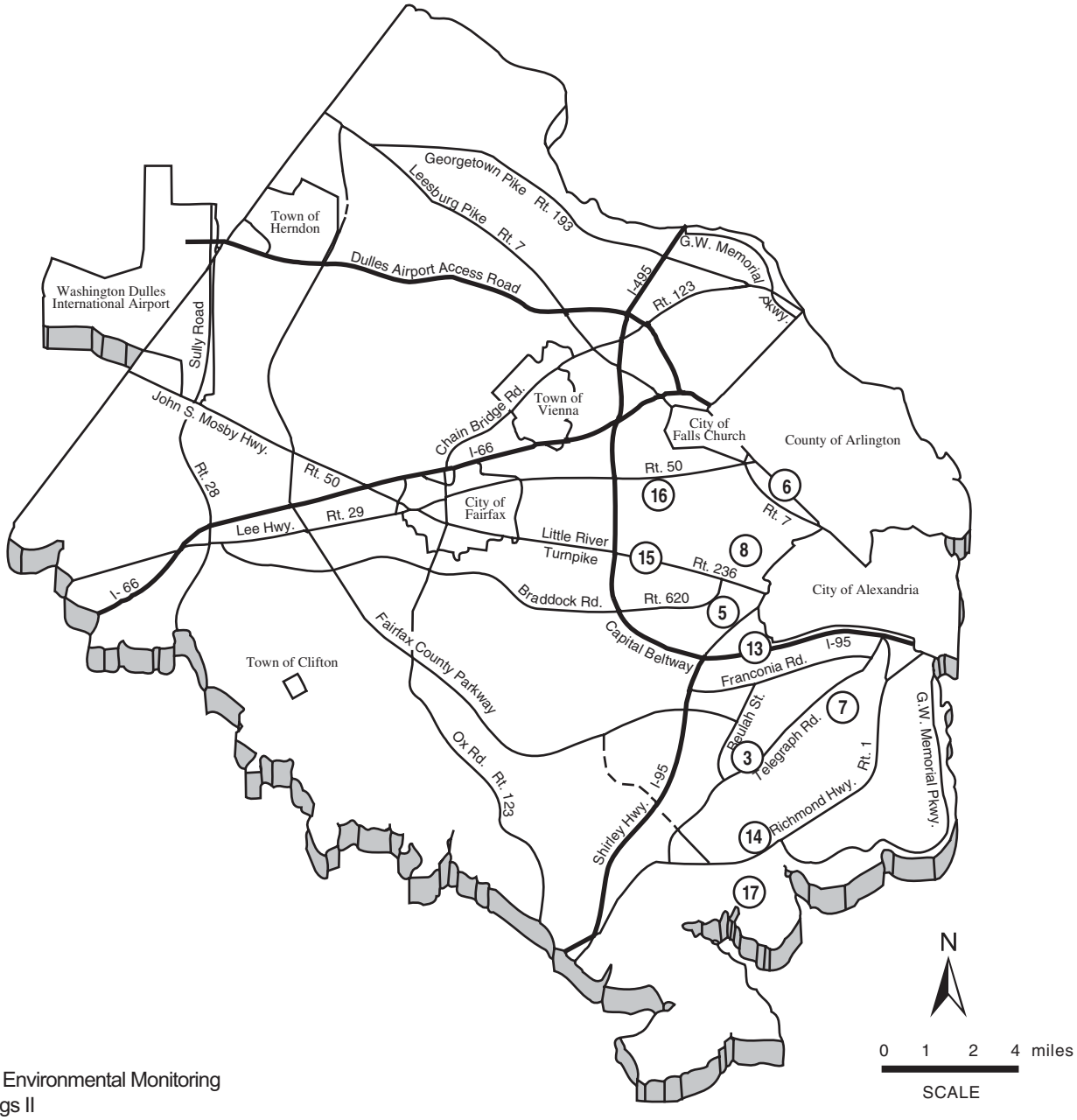
Notes:
Numbers in bold italics represent funded amounts.
A "C" in the Authorized or Expended Column denotes a continuing project.

Key: Source of Funds

B	Bonds
G	General Fund
S	State
F	Federal
X	Other
U	Undetermined

Stormwater Management and Other Neighborhood Improvements

Location of CIP Projects



3. Kingstowne Environmental Monitoring
5. Indian Springs II
6. Long Branch
7. Hayfield Farms
13. Brookland/Bush Hill
14. Mount Vernon Manor
15. Fairdale
16. Holmes Run Valley
17. Mount Vernon Hills

Note: Map numbers correspond to the project descriptions in the text and on the summary tables. Only CIP projects with selected fixed sites are shown on the map.